Flexible Plastic Tube with Reinforced End

~~Tube, Use of a Plastic Bag and Process for Producing a Tube~~

BACKGROUND OF THE INVENTION

The invention relates to a flexible plastic tube with a reinforced end. ~~tube and the use of a plastic bag~~ The tube is made of a plastic ~~with a~~ film material ~~of plastic~~ which forms one face wall and two side walls of the tube.

Resealable bags for holding liquids or pastes are generally made of plastic material with very thin walls. These bags are therefore very unstable and flexible. Therefore they are not suited as tubes.

In tubes the requirement is especially that they can be set up with the sealing cap pointed downward. Here the danger is that the tube will tip over when the film material deforms under the weight of the contents of the tube.

SUMMARY OF THE INVENTION

The object of the invention is mainly to make the tube such that the above described danger of tipping over, when the tube is placed as indicated on the sealing cap, is reduced.

The object is achieved by the invention described below ~~as claimed in the independent claims.~~

~~Advantageously~~ Preferably, the film material is a laminate which has at least one 60 to 200 micron thick inner seal layer of polyolefin and a 10 to 25 micron thick outside layer of polyester, the strip-shaped side edge sections each have a width of at least 6.5% of the total width of the side walls, but in any case are at least 4 mm wide.

The side walls are joined flat to another along two strip-shaped side edge sections and along one strip-shaped end edge section and are provided with a shoulder piece which is stiff compared to the film material and which has a sealable outlet connection piece and a flange which is attached to the face wall.

Advantageously such a simple bag construction with bag material can be modified in the simplest way so that a tube is formed.

BRIEF DESCRIPTION OF THE DRAWINGS

~~Embodiments of the invention are detailed below.~~ In the accompanying drawings,

Figure 1 shows a side view of a bag tube,

Figure 2 shows a section along line 2-2 in Figure 1 and

Figure 3 shows on a larger scale a cross section through the film material of the bag tube, for example in the area of the circle A in Figure 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The bag tube which is shown in Figures 1 and 2 has two side walls 11 and 12 and one face wall 13 which are formed by a piece of film material of plastic. The film material is preferably thin, light, and flexible. As claimed in the invention it is mainly a laminate with an inner seal layer 14 (Figure 3) with a thickness d_1 of 60 to 200 microns, and with an outside layer 15 with a thickness d_2 of 10 to 25 microns. The inner seal layer 14 consists of a polyolefin, preferably polypropylene, polyethylene or a mixed polymer. It can also consist of several layers of different polyolefins. The outside layer 15 consists of polyester, preferably polyethylene terephthalate or polyethylene

napthhalate or a mixed polymer of for example 90% to 95% PET and 10% to 5% PEN. Between the inner seal layer 14 and the outside layer 15 there can feasibly be a barrier layer 16. The barrier layer 16 can consist for example of aluminum with a thickness d_3 from 7 to 12 microns or of para-aramide (especially Kevlar).

The two side walls 11 and 12 are tightly connected flat to one another along the two strip-shaped side edge sections 17 and 18 and along one end edge section 19, especially welded. The width B of the side walls 11, 12 in the embodiment is roughly 100 mm each. The side edge sections 17 and 18 each have a width b which is 7% in the embodiment, but generally roughly 6.5 % to 10% of the width B of the side walls 11, 12. For smaller tubes the width b is at least 4 mm. The width b of the weld seams of the two side edge sections 17, 18 thus optimally ensures significant stiffening of the tube body.

A shoulder piece which has a closable opening in the form of an outlet connection piece 20 is attached to the end wall 13. The outlet connection piece 20 is shown closed with a screw cap 21. From the outlet connection piece 20 a flange 22 proceeds which adjoins the face wall 13 on the inside and is attached tightly terminating it, preferably welded tight. The flange 22 on the edges of the face wall 13 has two angled clips 23 and 24 which adjoin the middle areas of the side walls 11 and 12 and which run parallel to the side walls 11 and 12. The clips 23 and 24 stiffen the middle areas of the side walls 11 and 12 adjacent

to the face wall 13. At the same time they protect the film material against twisting and/or damage when the tube is held with one hand in the indicated areas of the side walls 11, 12 for screwing the sealing cap 21 on and off. The shoulder piece can otherwise have different shapes and it could also be attached externally on the face wall 13. The shoulder piece 20, 22, 23, 24 is relatively stiff compared to the film material of the side walls 11, 12 and the face wall 13.

In conjunction with stiffening by the side edge sections 17 and 18 a tube body which is stiff enough for all practical requirements is formed. An additional increase in the stability of the tube against lateral tipping arises in this embodiment by the inner boundaries of the two side edge sections 17 and 18 which face one another in the area of the face wall 13 as shown at 25 and 26 being angled to the inside towards one another. At the same time, in this way the shoulder corners - between the parts 25, 26 and the face wall 13 - are less deep, and the volume of the air enclosed at most therein when the tube is filled is smaller. Furthermore a larger part of the axial length of the outlet connection piece 19 projects downward beyond the shoulder corners. Instead of angled as shown, the inner boundaries of the side edge section 17, 18 can also be bent accordingly.

In the course of production and filling, first of all the two side walls 11 and 12 are welded together along the side edge sections 17 and 18 and the shoulder piece is attached with the

outlet connection piece 20 and the screw cap 21. Then the tube body can be filled from the end opposite the outlet connection piece 20. Thereupon the end edge section 19 is welded so that the tube is closed.

Handling of the tube is greatly facilitated by the stiffening of the tube body which is achieved by means of the wide side edge sections 17 and 18.

Since the invention is subject to modifications and variations, it is intended that the foregoing description and the accompanying drawings shall be interpreted as only illustrative of the invention defined by the following claims.

~~Claims~~

We claim:

1. A tube made of a plastic ~~with a~~ film material ~~of plastic, which forms~~ forming one face wall (13) and two side walls (11, 12) of the tube, the side walls (11, 12) being joined flat to another along two strip-shaped side edge sections (17, 18) and along one strip-shaped end edge section (19), and with a shoulder piece (20, 22, 23, 24) which is stiff compared to the film material (11, 12, 13) and which has a sealable outlet connection piece (20) and a flange (22) which is attached to the face wall (13), the film material (11, 12, 13) being a laminate which has at least one 60 to 200 micron thick inner seal layer (14), preferably of polyolefin, and a 10 to 25 micron thick outside layer (15), preferably of polyester, the strip-shaped side edge sections (17, 18) each having a width (b) which is at least 6.5% of the total width (B) of the side walls (11, 12), but in any case is at least 4 mm, the inner boundaries of the two side edge sections (17, 18) facing one another in the area of the face wall (13) being angled or bent to the inside towards one another.

2. A tube as claimed in claim 1, wherein the flange (22) of the shoulder piece (20, 22, 23, 24) at the edges of the face wall (13) has two bent clips (23, 24) which adjoin the middle areas of the side walls (11, 12).

3. A tube as claimed in claim 1 or 2, wherein the inner seal layer (14) consists of polypropylene and/or polyethylene.

4. A tube as claimed in claim 1 to 3, wherein the outside layer (15) consists of polyethylene terephthalate and/or of polyethylene naphthalate.

5. A tube as claimed in one of claims 1 to 4, wherein between the inner seal area (14) and the outer layer (15) there is a barrier layer (16).

6. A tube as claimed in claim 5, wherein the barrier layer (16) consists of aluminum with a thickness from 7 to 12 microns.

7. A tube as claimed in claim 5, wherein the barrier layer (16) consists of para-amide.

8. Use of a plastic bag with a film material of plastic, which forms one face wall (13) and two side walls (11, 12), the side walls (11, 12) being joined flat to another along two strip-shaped side edge sections (17, 18) and along one strip-shaped end edge section (19), and with a shoulder piece (20, 22, 23, 24) which is stiff compared to the film material (11, 12, 13) and which has a sealable outlet connection piece (20) and a flange (22) which is attached to the face wall (13), the film material (11, 12, 13) being a laminate which has at least one 60 to 200 micron thick inner seal layer (14), preferably of polyolefin, and a 10 to 25 micron thick outside layer (15), preferably of polyester, the strip- shaped side edge sections (17, 18) each having a width (b) of at least 6.5% of the total width (B) of the side walls (11, 12), but in any case at least 4 mm, the inner boundaries of the two side edge sections (17, 18) which face one

another in the area of the face wall (13) being angled or bent to the inside towards one another, as a tube.

9. A process for producing a tube from a film material of plastic, which forms one face wall (13) and two side walls (11, 12) of the tube, the side walls (11, 12) being joined flat to another along two strip-shaped side edge sections (17, 18), and a shoulder piece (20, 22, 23, 24) which is stiff compared to the film material (11, 12, 13) being connected to a closed outlet connection piece (20) with the face wall (13), the film material (11, 12, 13) being a laminate which has at least one 60 to 200 micron thick inner seal layer (14), preferably of polyolefin, and a 10 to 25 micron thick outside layer (15), preferably of polyester, and the strip-shaped side edge sections (17, 18) each having a width (b) of at least 6.5% of the total width (B) of the side walls (11, 12), but in any case at least 4 mm, being welded to one another such that the inner boundaries of the two side edge sections (17, 18) facing one another in the area of the face wall (13) are angled or bent to the inside towards one another, that then the tube is filled from its side opposite the face wall (13) and then being closed, preferably welded along one strip-shaped end edge section (19).

Abstract

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A face wall (13) and two side walls (12) of the tube and of the plastic bag used as the tube are formed by a laminate with a 60 to 200 micron thick inner seal layer of polyolefin and a 10 to 25 micron thick outside layer of polyester. The side walls (12) are tightly connected flat to one another along two strip-shaped side edge sections (17, 18) such the inner boundaries of the two side edge sections (17, 18) which face one another in the area of the face wall (13) are angled or bent to the inside towards one another. A shoulder piece (20, 22, 23, 24) has a sealable opening in the form of an outlet connection piece (20) and a flange (22) which is connected to the face wall (13). The strip-shaped side edge sections (17, 18) each have a width (b) which is at least 6.5% of the total width (B) of the side walls (12). This construction of the tube reduces the danger that the side walls could buckle and the tube could tip over when it is set up with the sealing cap (21) screwed onto the outlet connection piece (20) pointed downward.

(Figure 1).